

**COLLAPSIBLE TABLE****FIELD OF THE INVENTION**

This invention relates generally to a collapsible table having a table top formed by a pair of hinged half-sections, and more particularly the invention is  
5 concerned with such a reinforced collapsible table where at the collapsed position the sections are folded together, receiving between them the legs.

In connection with the present invention the terms *collapsible* and *foldable* are used interchangeably.

**BACKGROUND OF THE INVENTION AND PRIOR ART**

10 A dining table intended for use only on special occasions, such as for banquets or picnics, must be stored when not in use. Since a dining table occupies a relatively large space, the need to store the table presents a problem, particularly when there are many tables to be stored and the storage facilities are limited. A preferred form of banquet table is therefore one that is collapsible to form a  
15 compact structure that occupies relatively little storage space (and optionally could be carried in a car) and that can be easily carried from one place to another.

One type of banquet tables comprises a non-collapsible, rigid and uniform table top, with only the legs being displaceable between an operative state for supporting the table top, and a storage state where the legs are folded against the  
20 table top, typically against its bottom surface. Such a table is disclosed, for example, in US Patent 6,112,674.

A typical collapsible table includes a pair of interhinged half-sections to each of which is hingedly attached a leg assembly. To collapse this table its leg assemblies are first folded in against the half-sections of the tabletop, and the half-  
25 sections are then folded together to reduce the table to a compact structure requiring little storage space. To erect the table at its site of use, the half-sections are unfolded to form the tabletop and the leg assemblies are folded out to support this tabletop. A collapsible table in this format is disclosed in the US Patent 5,357,872 to Wilmore.

A banquet table may be subjected to heavy loads in the course of its use and accordingly, one of the aspects of the present invention resides in a collapsible banquet table having reinforced half-sections made of plastic material. US Patent No. 6,058,853 discloses a collapsible banquet table having blow molded plastic half-sections reinforced by rigidified sheets.

However, blow molding is a relatively difficult and costly procedure, and the need to include rigidified reinforcing sheets adds to the cost of producing the half-sections of the table. Consequently the expenses incurred in manufacturing such a collapsible table are substantial and may militate against their sale and use.

It is an object of the present invention to provide a light weight and inexpensive collapsible table having a reinforced structure rendering the table capable of supporting heavy loads which seek to deform the table and whereby bending forces which seek to bend the table along either the longitudinal or transverse axis are resisted.

## **SUMMARY OF THE INVENTION**

According to the present invention there is provided a collapsing table comprising a table top formed of a pair of pivotable table top half-sections hinged to one another at their adjacent edges along a center-line of the table and displaceable between an open position where said half-sections are coplanar and a folded position where said half-sections overlap one another; the table characterized in that each section has at an undersurface thereof a transverse support member pivotally articulated thereto with a leg associated with each lateral edge of the transverse support member, and a pair of longitudinal support members pivotally articulated to the undersurface; said support members are displaceable between erect and collapsed positions whereby the transverse support member is prohibited from collapsing as long as at least one of the longitudinal support member is erect. According to a particular embodiment, each lateral end of the transverse support member receives a leg of the table.

To improve stability and load-bearing resistance, there may further be provided a central support member pivotally articulated, along the center-line, at undersurfaces of the top half-sections. Said central support member may comprise one or more table legs.

- 5           In order to obtain a firm table structure at its open position, an edge of each longitudinal support member is engageable with a corresponding lateral edge of the transverse support member at the erect position thereof and optionally, adjoining ends of the longitudinal support members and lateral edges of the central support member are engageable at the erect position thereof.
- 10       According to an embodiment of the invention, the longitudinal support member extends between the central support member and the transverse support member.

Typically, each section is formed at its adjacent edge with a transverse abutment surface, whereby at an open state of the table said abutment surfaces bear against one another.

- 15       According to various embodiments and modifications of the present invention, the folding table may have one or more of several features, for example:

- The central support member is pivotally articulated, along the center-line, at undersurfaces of the top half-sections.
- 20       Optionally, both top half-sections are pivotable about a hinge common also for the central support member.
- At the erect position, the support members have substantial portions extending flush with the undersurface of the respective top half-sections.
- 25       •           The support members snappingly displace between their collapsed and erect positions.
- All or part of the support members are snappingly engaged with one another at their erect position.

- The support members are pivotally articulated to the undersurfaces by snap-type hinges. For example, the support members are articulated to the half-sections by first hinge segments integrally formed at the undersurfaces and corresponding second hinge segments integrally formed at the support members.
- The half-sections are integrally formed with a peripheral downwardly extending skirt portion.
- At least some of the support members are retainable at the erected position by a snap-type support arrangement.
- A carrying handle or a carrying portion is fitted to either one or both of the top half-sections. According to one particular embodiment, the handle is retractable from between the half-sections at the folded position thereof.

Optionally, a locking arrangement is provided for securing the table at its closed/folded position namely, retaining the half-sections at their folded position, e.g. by a locking latch, by projections formed at one half-section snapingly engageable with corresponding receptacles formed at the opposite half-section, etc.

## BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the invention and to see how it may be carried out in practice, an embodiment will now be described, by way of a non-limiting example only, with reference to the accompanying drawings, in which:

**Fig. 1** is top perspective view of a table according to the present invention, at its open position;

**Fig. 2** is a perspective view of the table, at its closed/collapsed position;

**Fig. 3A** is a bottom perspective view of the table, at its open position;

**Fig. 3B** is a section along line II-II in Fig. 3A;

**Fig. 3C** is an enlargement of the portion marked III in Fig. 3A;

**Figs. 4A to 4E** illustrate consecutive steps of collapsing a table according to the present invention, wherein:

**Fig. 4A** is a bottom perspective view of the table, at a first step of collapsing the table, with a longitudinal support member thereof at an intermediate position;

**Fig. 4B** is an enlargement of the portion marked IV in Fig. 4A;

**Fig. 4C** illustrates the table with all its longitudinal support members at the folded position;

**Fig. 4D** illustrates the table with its transverse support members and their associated legs collapsed; and

**Fig. 4E** illustrates the table at the final collapsing step, with its top surface partially folded.

## DETAILED DESCRIPTION OF THE INVENTION

Reference is first made to Fig. 1 illustrating a collapsible table in accordance with the present invention generally designated **10** comprising two pivotable table top half sections **14** and **16** hingedly connected to one another and foldable about a pivot axle **18** (see in Figs. 3A and 4A), extending transversally at a center line 20 of the table **10**. In the open position of Fig. 1 the half sections **14,16** are coplanar.

The table **10** is supported by six legs arranged in pairs and designated **22A** and **22B**; **24A** and **24B**; **26A** and **26B** and will be discussed in more detail hereinafter.

The table **10** is foldable/collapsible between an open position as illustrated in Fig. 1 where the table top is supported by the legs, and a closed/folded/collapsed position as illustrated in Fig. 2. Also seen in Fig. 2 is a latch **30** to retain the half sections **14** and **16** in the closed, overlapping position.

In Fig. 3A the table **10** is illustrated from its bottom side and as can be seen at each of the half sections **14** and **16**, in the present case made of plastic material, is formed with a peripheral skirt portion **34**, increasing the rigidity and load bearing ability of the table **10**, and further, providing space for  
5 accommodating the legs and the support members, in the closed position, as will become apparent hereinafter.

It is further noticed in Fig. 3A that the ends of legs **22A** and **B** and **26A** and **B** are attached to a transversed support member **40** pivotably articulated to an under surface **42** of the half sections **14** and **16** by means of hinge portions **44**.

10 The arrangement is such that the under surface **42** of the half sections **14** and **16** comprises several hinge segments **50** (see Fig. 3B) integrally formed therewith and adapted for snap-type engagement with a receptacle hinge cavity **54** integrally formed with the transverse support member **40**. The hinge segments **50** are sized and shaped such that the transverse support members **40** are  
15 snappingly displaceable in a toggle type manner between an erect position (Figs. 3A and 3B) and a collapsed position (Fig. 4D) and further such that in the erect position a surface **58** of the support member **40** flushingly bears against a corresponding surface **60** at the under surface **42**.

Further noticed in Fig. 3A there are provided four longitudinal support  
20 members **64**, each extending along a corresponding edge of the respective half section. The longitudinal support members **64** are pivotably articulated to the under surfaces **42** of the half sections **14** and **16**, in the same manner as disclosed hereinabove in connection with the transverse support members **40**, with particular reference to Fig. 3B.

25 A central support member **68** is mounted on the common pivot axle **18** pivotably attaching the half sections **14** and **16** whereby at the open position of the table **10**, when the two half sections are coplanar, the central support member bears against corresponding portions at the undersurface **42** of the half sections, to thereby provide increased load bearing and stability of the table. Legs **24A** and  
30 **24B** extend from the central support member **68**. In accordance with other

particular embodiments (not illustrated) the central support member 68 may be omitted entirely or may be designed to have one central leg or no legs at all.

As can best be seen in Fig. 3A, at the open position of the table 10, all of the support members 40 and 64 stand erect and perpendicular to the undersurface 42; the transverse support members 40 and the central support member 68 extend parallel to the pivot axle 18; and the longitudinal support members 64 extend at right angles thereto.

In this position when all of the support members 40 and 64 are erect, a closed box-like support structure is formed by them and each support member engages at its respective ends corresponding ends of a mating support member by means of a snap-type engagement as will be described in more detail with reference to Figs. 3C and 4B. The construction of the box/frame like structure gives rise to a table of improved rigidity and load bearing ability in both the longitudinal and transverse directions.

The support members 40 and 64 are retained in their erect position, in accordance with an embodiment of the present invention, both by the toggle-type hinge arrangement of the support members to the under surface 42 of the half sections 14 and 16 and by the snap-type engagement between adjoining ends of respective support members. An example of such an engagement arrangement is seen in Fig. 4B, which is an enlargement of the portion marked IV in Fig. 4A, where the longitudinal support member 64 comprises four lateral projections 70A, 70B, 70C and 70D designed for snap-engagement within corresponding receptacles designated 72A, 72B, 72C and 72D, respectively, formed at a leg support portion 76 receiving leg 26B of the transverse support member 40.

Thus, displacement of a longitudinal support member from its erect position to its collapsed position requires some force thereby to prevent unintentional displacement thereof.

Fig. 3C is an enlargement of the portion marked III in Fig. 3A whereby an end portion of the lateral support member 64 is formed with three projections 82A, 82B and 82C designed for snap-engagement within corresponding

receptacles (not seen in this position) formed in leg receptacle **86** supporting leg **24B** of the central support member **68**.

This arrangement also requires application of some reasonable force to thereby prevent unintentional collapsing of the longitudinal support members **64**.

5        With further reference made to Figs. 4A to 4E, it will now be explained how the table **10** is collapsed/folded from its open position as illustrated in Figs. 1 and 3A to its closed/folded position as in Fig. 2.

At a first step (Fig. 4A) the four longitudinal support members **64** are collapsed by pivotally displacing them inwardly in the direction of arrow **90**.  
 10    Fig. 4C illustrates the table **10** after the four longitudinal support members **64** have been collapsed and lie flush against the under surface **42** of the half sections **14** and **16** (Fig. 4C).

Only at this point, after the longitudinal support members **64** of each half section **14** and **16** have been collapsed, the transverse support members **40** may  
 15    be collapsed by turning them inward as indicated by arrows **94** in Fig. 4C such that the transverse support members **40** lie over the already folded longitudinal support members **64**. It is noticed that in the position shown in Fig. 4D the collapsed transverse support members **40** and their respective legs **22A**, **22B** and **26A**, **26B** do not occupy the entire space formed by the peripheral skirt **34**,  
 20    thereby allowing sufficient space to accommodate the central support member **68** and the central legs **24A** and **24B**.

At a final step the half sections **14** and **16** are pivotally displaced towards one another (arrow **98** in Fig. 4E) until obtaining the fully closed position as in Fig. 2.

25        Retaining the table **10** in its closed position, may be obtained by closing latch **30** (Fig. 2) or by snap type arrangement as illustrated for example in Fig. 4E wherein the skirt portion **34** of the half section **14** comprises two projections **102** fitted for snap engagement within corresponding two receptacles **104** fitted on the skirt **34** of half section **16**.



Finally, carrying the table 10 from one place to another may be facilitated by a handle 110 formed at half sections 14 by means of a depression at the skirt portion 34 enabling one to insert his hand between the half section when the table is in its closed position. In accordance with a variation thereof, such a depression  
5 may be formed also at the half section 16 and optionally also at the opposed sides thereof. As an alternative, there may be provided a handle 114 (Fig. 4E) displaceable between an extracted position as shown, and a retracted position (not shown) merely by folding or sliding it about a suitable hinge or rack.

While there has been shown an embodiment with several modifications of  
10 the invention, it will be appreciated by a person of the art that many changes may be made therein without departing from the spirit and the scope of the invention, *mutatis mutandis*.